What is Claimed is:

1. A method of slicing a semiconductor substrate, the method comprising the steps of:

applying N times, where N is a finite number, the steps of:

etching a surface of said semiconductor substrate with a time dependent concentration of F- $F^-(t)$, and a time dependent current I, $I(t)$, $([F^-, I]_i(t), i = 1,2,...,N)$ wherein 'i' identifies a porous layer, until a porous layer having surface roughness $SR(i)$ is formed and said porous layer is released from said substrate;

removing the released porous layer i from the surface of said substrate, wherein SR(i) is maintained below a desired threshold level.

2. The method according to Claim 1, where $[F^-]_i(t)$ is substantially constant over time.

3. The method according to Claim 1, where $[I]_i(t)$ is substantially constant over time.

4. The method according to Claim 1, wherein N=1 or 2.

5. The method according to Claim 1, wherein an initial semiconductor substrate surface is flat and the value of surface roughness of a subsequently released porous layers remains within a desirable range for i>3.

6. The method according to Claim 1, wherein said semiconductor substrate comprises a silicon substrate.

7. The method according to Claim 1, wherein said semiconductor substrate comprises a semiconductor ingot.

8. An apparatus for slicing a semiconductor substrate, comprising:

a container comprising at least one of first, second, third, and fourth holes;

an etching solution contained within said container;

an isolating material configured to protect at least a potion of said semiconductor substrate from said etching solution upon insertion into said

container through said first hole and after exposing said substrate to said etching solution;

a controller configured to regulate insertion of said semiconductor substrate into said container and said etching solution;

an extractor configured to remove said released layer from said container via said second hole ;

a first electrode connected to an unexposed portion of said substrate;

a second electrode located in said etching solution; and

a voltage source configured to apply a voltage between said first and second electrodes.

9. The apparatus of Claim 8, further comprising a flow controller configured to provide a desirable concentration of said etchant in said etching solution by transferring etching solution into said container via said third hole and removing etchant solution from said container via said fourth hole.

10. The apparatus of Claim 8, further comprising a detector configured to detect said lift-off of porous layers from said substrate.

11. The apparatus of Claim 8, wherein the isolating material comprises a tube within which the semiconductor substrate is inserted.

12. An apparatus for slicing a semiconductor substrate, comprising:

means for containing an etching solution;

means for protecting at least a potion of said semiconductor substrate from said etching solution upon insertion into said container through a first hole and after exposing said substrate to said etching solution;

means for controlling rate of insertion of said semiconductor substrate into said containing means and said etching solution;

means for removing said released layer from said container via a second hole;

means for applying a voltage between first and second electrodes, the first electrode being connected to an unexposed portion of said substrate, and the second electrode being located in said etching solution.

13. The apparatus of Claim 12, further comprising means for controlling concentration of said etchant in said etching solution by transferring etching solution into said container via a third hole and removing etchant solution from said container via a fourth hole.

14. The apparatus of Claim 12, further comprising means for detecting said lift-off of porous layers from said substrate.

15. The apparatus of Claim 12, wherein the protection means comprises a tube within which the semiconductor substrate is inserted.

16. A method of slicing a semiconductor substrate, the method comprising:

applying a time-dependent current to a surface the semiconductor substrate that is immersed in a solution having a controlled concentration of F-;

releasing a layer from the semiconductor substrate in response to the application of the time-dependent current for a period of time; and

repeating the applying and releasing steps using the same values of time-dependent current and concentration of F-.

17. The method according to Claim 16, where the concentration of F- is controlled to be substantially constant over time.

18. The method according to Claim 16, where the current value is substantially constant over time.

19. The method according to Claim 16, wherein the repeating step is performed until the roughness of a surface of the released layer converges to a predetermined level.

20. The method according to Claim 16, wherein said semiconductor substrate comprises a silicon substrate.

21. The method according to Claim 16, wherein said semiconductor substrate comprises a semiconductor ingot.